

# PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents  
United States Patent and Trademark  
Office  
Box PCT  
Washington, D.C.20231  
ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

<b>Date of mailing (day/month/year)</b> 20 December 1999 (20.12.99)	
<b>International application No.</b> PCT/US99/04716	<b>Applicant's or agent's file reference</b> 615.1PC
<b>International filing date (day/month/year)</b> 03 March 1999 (03.03.99)	<b>Priority date (day/month/year)</b> 03 March 1998 (03.03.98)
<b>Applicant</b> PADIDAM, Malla et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:  
04 October 1999 (04.10.99)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

<b>The International Bureau of WIPO</b> 34, chemin des Colombettes 1211 Geneva 20, Switzerland	<b>Authorized officer</b> Céline Faust
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

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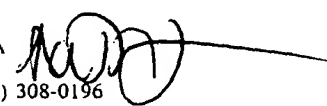
Applicant's or agent's file reference 615.1PC	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US99/04716	International filing date (day/month/year) 03 MARCH 1999	Priority date (day/month/year) 03 MARCH 1998
International Patent Classification (IPC) or national classification and IPC Please See Supplemental Sheet.		
Applicant THE SCRIPPS RESEARCH INSTITUTE		

- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 8 sheets.  
☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority. (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 0 sheets.

- This report contains indications relating to the following items:

- ☒ Basis of the report
- ☐ Priority
- ☒ Non-establishment of report with regard to novelty, inventive step or industrial applicability
- ☐ Lack of unity of invention
- ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Certain documents cited
- ☒ Certain defects in the international application
- ☒ Certain observations on the international application

Date of submission of the demand  04 OCTOBER 1999	Date of completion of this report  27 JUNE 2000
Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer  ASHWIN MEHTA  Telephone No. (703) 308-0196

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. \_\_\_\_\_

PCT/US99/04716

**I. Basis of the report**1. With regard to the **elements** of the international application:\*

- ☒ the international application as originally filed
- ☒ the description:  
pages \_\_\_\_\_ (See Attached) \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☒ the claims:  
pages \_\_\_\_\_ (See Attached) \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, as amended (together with any statement) under Article 19  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☒ the drawings:  
pages \_\_\_\_\_ (See Attached) \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☒ the sequence listing part of the description:  
pages \_\_\_\_\_ (See Attached) \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in printed form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☒ The amendments have resulted in the cancellation of:

- ☒ the description, pages \_\_\_\_\_ NONE \_\_\_\_\_
- ☒ the claims, Nos. \_\_\_\_\_ NONE \_\_\_\_\_
- ☒ the drawings, sheets/fig \_\_\_\_\_ NONE \_\_\_\_\_

5. ☐ This report has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\*Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

## III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been and will not be examined in respect of:

- ☐ the entire international application.
- ☒ claims Nos. 7, 9, 11, 31, 32, 42, 43, 49, 50

because:

- ☐ the said international application, or the said claim Nos. \_ relate to the following subject matter which does not require international preliminary examination (*specify*).

- ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. \_ are so unclear that no meaningful opinion could be formed (*specify*).

- ☐ the claims, or said claims Nos. \_ are so inadequately supported by the description that no meaningful opinion could be formed.

- ☒ no international search report has been established for said claims Nos. (See Attached).

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

- ☐ the written form has not been furnished or does not comply with the standard.
- ☒ the computer readable form has not been furnished or does not comply with the standard.

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US99/04716

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. statement**

Novelty (N)

Claims (Please See supplemental sheet) YESClaims (Please See supplemental sheet) NO

Inventive Step (IS)

Claims (Please See supplemental sheet) YESClaims (Please See supplemental sheet) NO

Industrial Applicability (IA)

Claims (Please See supplemental sheet) YESClaims (Please See supplemental sheet) NO**2. citations and explanations (Rule 70.7)**

Claims 1-6, 8, 10, 12-30, 33-41, and 44-48 meet the criteria set out in PCT Article 33(2)-(4), because the prior art does not teach or fairly suggest a method for producing resistance to ssDNA viruses in a plant comprising introduction of a ssDNA-binding protein of the Inoviridae virus family into said plant. The invention has the industrial applicability of conferring controlling disease of agronomically important crop plants caused by geminiviruses.

----- NEW CITATIONS -----

NONE

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US99/04716

**VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:

Claim 13 is objected to under PCT Rule 66.2(a)(iii) as containing the following defect(s) in the form or contents thereof: the period punctuation mark is missing at the end of the claim.

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

Claims 1-5, 8, 10, 12-22, 25-29, 33-37, 39, 40, and 44-47 are objected to as lacking clarity under PCT Rule 66.2(a)(v) because practice of the claimed invention is not enabled as required under PCT Rule 5.1(a) for the reasons set forth in the immediately preceding paragraph.

While the description indicates that plants expressing the M13 gene 5 protein develop mild symptoms in response to infection from geminiviruses, and slows viral movement, it does not demonstrate that the plant is completely resistant, as claimed. Padidam et al (1999) teaches that plants infected with a geminivirus encoding the M13 gene 5 protein show very mild symptoms, accumulate low levels of viral DNA, and have impaired viral movement compared to plants infected with virus that do not encode the gene 5 protein. However, the plants were not shown to be completely resistant to the virus (page 1615, second column, first full paragraph).

Also, the description does not indicate that the results were obtained with ssDNA binding proteins other than the M13 gene 5 protein. The gene 5 protein is non-specific. It is unknown if any ssDNA binding protein which may have a more limited substrate specificity would yield the same results. Given the breadth of the claims encompassing any ssDNA-binding protein from the Inoviridae family, and complete resistance against all ssDNA viruses, unpredictability of the art and lack of guidance of the description, undue experimentation would be required by one skilled in the art to make and use the claimed invention.

Claims 1 and 5 are objected to as lacking clarity under PCT Rule 66.2(a)(v) because practice of the claimed invention is not enabled as required under PCT Rule 5.1(a) for the reasons set forth in the immediately preceding paragraph.

The description discusses the possible role of the coat protein of the tomato leaf curl geminivirus (ToLCV) in viral replication. However, it does not teach that the coat protein from any virus of the Inoviridae family can bind any ssDNA from any ssDNA virus. Further, Padidam et al (1999) discuss a role for the ToLCV coat protein in which it inhibits minus-strand synthesis or by regulating gene expression, rather than binding ssDNA (page 1615, first column, last paragraph). Padidam et al also discuss results in which the alfalfa mosaic virus coat protein was found in tight association with the viral RNA polymerase, and that purification of geminivirus replication complexes is required to directly assess the role of coat protein in replication (page 1615, top of second column). Given the breadth of the claims encompassing binding of ssDNA by coat protein of any Inoviridae virus, unpredictability of the art and lack of guidance of the description, undue experimentation would be required by one skilled in the art to make and use the claimed (Continued on Supplemental Sheet.)

**Supplemental Box**

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

Sheet 10

**CLASSIFICATION:**

The International Patent Classification (IPC) and/or the National classification are as listed below:

IPC(7): C12N 5/04, 5/14, 15/05, 15/31, 15/63, 15/82; A01H 1/00, 5/00 and US Cl.: 435/69.1, 320.1, 410, 418, 419, 468; 536/23.72; 800/278, 279, 280, 288, 295, 298, 301

**I. BASIS OF REPORT:**

This report has been drawn on the basis of the description,  
page(s) 1-44, as originally filed.  
page(s) NONE, filed with the demand.  
and additional amendments:  
NONE

This report has been drawn on the basis of the claims,  
page(s) 45-53, as originally filed.  
page(s) NONE, as amended under Article 19.  
page(s) NONE, filed with the demand.  
and additional amendments:  
NONE

This report has been drawn on the basis of the drawings,  
page(s) 1-5, as originally filed.  
page(s) NONE, filed with the demand.  
and additional amendments:  
NONE

This report has been drawn on the basis of the sequence listing part of the description:  
page(s) 1-6, as originally filed.  
pages(s) NONE, filed with the demand.  
and additional amendments:  
NONE

**III. NON-ESTABLISHMENT OF REPORT:**

No international search report has been established for claim numbers 7, 9, 11, 31, 32, 42, 43, 49, 50.

**V. 1. REASONED STATEMENTS:**

The report as to Novelty was positive (YES) with respect to claims 1-6, 8, 10, 12-30, 33-41, 44-48.  
The report as to Novelty was negative (NO) with respect to claims NONE.  
The report as to Inventive Step was positive (YES) with respect to claims 1-6, 8, 10, 12-30, 33-41, 44-48.  
The report as to Inventive Step was negative (NO) with respect to claims NONE.  
The report as to Industrial Applicability was positive (YES) with respect to claims 1-6, 8, 10, 12-30, 33-41, 44-48.  
The report as to Industrial Applicability was negative (NO) with respect to claims NONE.

**VIII. CERTAIN OBSERVATIONS ON THE APPLICATION (Continued):**

invention.

Claims 1-6, 8, 10, 12-16, 39-41, and 44-48 are objected to as lacking clarity under PCT Rule 66.2(a)(v) because practice of the claimed invention is not enabled as required under PCT Rule 5.1(a) for the reasons set forth in the immediately preceding paragraph.

The description does not teach any increase in resistance of plants against any ssDNA virus except geminiviruses. Not all viruses replicate in the same manner. Therefore it is not clear if the claimed invention would be effective in inhibiting



## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US99/04716

**Supplemental Box**

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

Sheet 11

infection in plants against all ssDNA viruses. The description, not the knowledge of one skilled in the art, must teach the claimed invention. Give the breadth of the claims encompassing resistance in plants against all ssDNA viruses, unpredictability of the art, and lack of guidance of the description as discussed above, undue experimentation would be required by one skilled in the art to make and use the claimed invention.